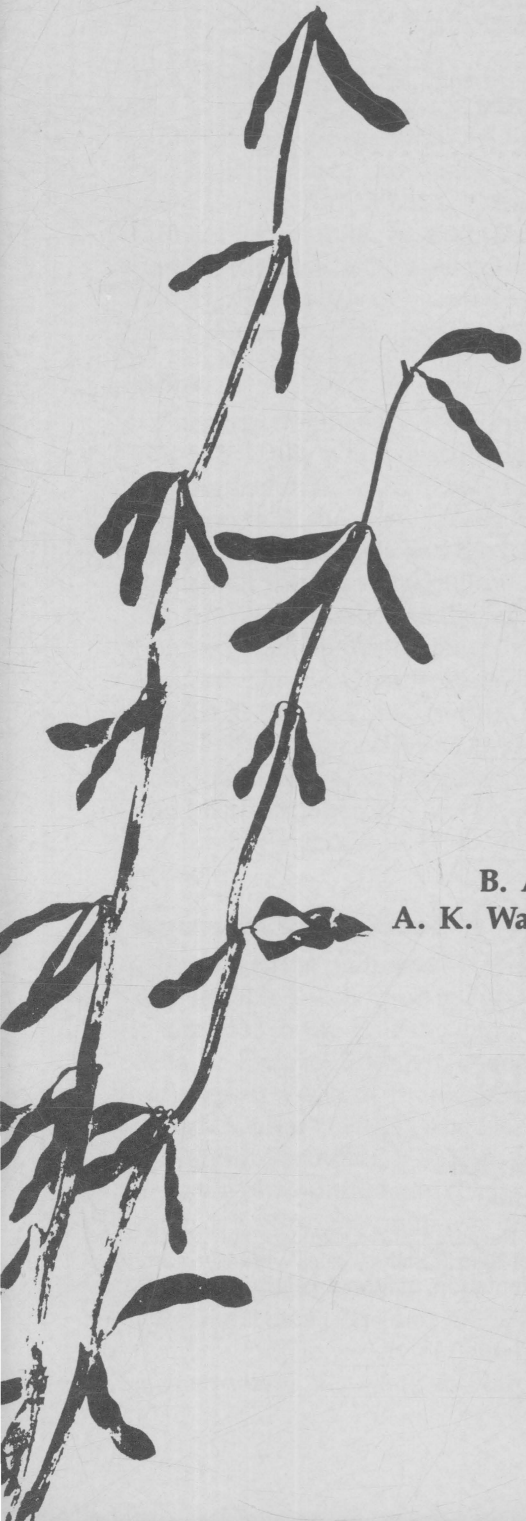
Special Circular 133 September 1989



Sherman Soybeans

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Ohio Agricultural Research
and Development Center
The Ohio State University
Wooster, Ohio

Contents

Kirklyn M. Kerr
Director

9-89-750

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Sherman is a new, high yielding soybean variety which was released by The Ohio State University, Ohio Agricultural Research and Development Center, September 1, 1985. Seed of Sherman was first available to farmers for planting in 1987. Performance data for Sherman and comparable varieties or commercial strains are presented in Tables 1-10. Sherman was previously designated as HW8067 in OARDC Agronomy Department Series No. 225, 1984 and 1985.

Origin

Sherman originated as an F_5 plant selection from the two-parent cross A72-512 x Pella which was made at the Isabela substation of the Puerto Rico Agricultural Experiment Station in December, 1975. A72-512 is an Iowa selection from the cross Amsoy x Wayne. The F_1 seed from the cross was also planted at Isabela and the later generations advanced by single seed descent at the Iowa Agriculture and Home Economics Experiment Station in 1976 and Isabela in the fall and winter of 1976-77. The F_5 plant selection was made in the winter of 1977-78 in Puerto Rico. The line was tested for seed yield in Ohio from 1978 to 1980 as AX-1751E-19 and from 1981 to 1984 as HW8067 and in the Uniform Soybean Tests, Northern States from 1981 to 1984 as HW8067 prior to release. Seed of Sherman was shared with foundation seed organizations in Illinois, Indiana, Kansas, Kentucky, and Missouri. Sherman was cooperatively released September 1, 1985 by experiment stations in Ohio, Illinois, Indiana, Kansas, Kentucky, and Missouri.

Agronomic Performance

Sherman has performed well in Ohio breeding trials as shown by the data in Table 1 were used in support of the release of Sherman. Sherman is superior to the Williams family of varieties and 2 percent better than Pella or Harper. Sherman seemed to perform best compared to other varieties at Western Branch, South Charleston, and at Northwestern Branch, Custar (Table 2). The Northwestern Branch and Ohio Department of Natural Resources (ODNR), Vickery sites normally exhibit moderate to severe phytophthora rot (*Phytophthora megasperma* f. sp. *glycinea* (Drech.) Kuan & Erwin). Sherman was comparable or higher yielding than Zane, Pella, A3127 or Williams, which are considered to be more tolerant to the disease than Sherman.

Regional data (1984 and 1982-84) indicated that Sherman yielded better than any public variety of comparable maturity (Table 3). Sherman performed about the same as Harper in 1982 and 1983. Seasonal rainfall

Table 1. Comparative yield (bu/a) for Sherman and other soybean varieties (ranked by maturity), from the Ohio Preliminary Tests (OPT), and the Advanced Line Tests (ALT), 1979 to 1984.

	OPT	ALT					Means		
Variety	1979 2 tests	1980 4 tests	1981 4 tests	1982 4 tests	1983 3 tests	1984 3 tests	1983-84 6 tests	1980-82 12 tests	1979-84 20 tests
Zane	56	54	38	54	48	51	50	49	49
Pella	54	53	38	52	45	51	48	47	48
Harper	—	—	—	—	45	50	48	—	—
SHERMAN	58	54	38	52	48	50	48	48	49
A3127	—	53	39	53	45	53	49	49	—
Cumberland	52	52	35	50	44	48	46	46	46
Williams 79	54	48	40	49	43	50	47	47	47
Williams	—	47	39	48	40	—	—	45	—
Williams 82	—	44	42	49	42	49	45	46	—

Table 2. Comparative yield (bu/a) for Sherman and other soybean varieties (ranked by maturity) by location[1] from the Advanced Line Tests 1980 to 1983.

Variety	OFS, Croton		Northwestern Branch, Custar		Western Branch, S. Charleston		OARDC, Wooster		ODNR, Vickery	
	1980-82	1983-84	1980-82	1983-84[2]	1980-82	1984	1980-82	1983-84	1980-82	1982
Zane	44	56	48	34	56	49	50	43	49	50
Pella	47	56	48	31	54	45	45	43	45	48
Harper	—	55	—	34	—	44	—	42	—	—
SHERMAN	44	55	52	37	54	47	42	43	50	48
A3127	46	56	52	38	53	46	45	44	50	52
Cumberland	44	52	48	33	50	43	44	46	46	44
Williams 79	43	51	48	43	54	47	42	40	51	51
Williams	42	—	46	—	51	—	45	—	46	40
Williams 82	40	50	49	48	51	46	44	39	52	52

[1] OFS is Ohio Foundation Seeds; Northwestern Branch, Western branch, and OARDC are two branch stations and the main research campus of the Ohio Agricultural Research and Development Center; and ODNR is Ohio Department of Natural Resources station, formerly North Central Branch, OARDC.

[2] This location had a severe phytophthora rot incidence in 1984 which is reflected in mean yield.

Table 3. Comparative yield (bu/a) for Sherman and other soybean varieties (ranked by maturity) from the Uniform Soybean Tests, Northern States, 1981 to 1983.

	All States					Ohio				
Variety	1981 9 tests	1982 25 tests	1983 22 tests	1982-83 20 tests	1982-84 67 tests	1981 2 tests	1982 4 tests	1983 4 tests	1984 4 tests	1982-84 12 tests
Zane	52	50	41	46	46	43	54	41	44	46
Pella	—	49	39	43	44	—	51	41	40	44
Hobbit	—	48	38	43	43	—	52	38	42	44
Harper	—	50	41	45	46	—	52	41	41	45
SHERMAN	51	50	41	50	47	46	51	41	49	47
Cumberland	51	49	39	—	—	49	51	41	—	—
Williams 82	—	48	39	46	44	—	47	42	49	46
Fayette	—	46	37	45	42	—	49	39	47	45

distribution is thought to have favored Sherman in 1984 and it outyielded Harper by 11 percent, giving a three-year mean 2 percent greater than Harper.

Sherman has continued to perform well in breeding trials compared to public varieties such as Pella and Williams 82 or private varieties (commercial strains) such as AP330 or TS350 (Table 4). As a public variety in the Ohio Soybean Performance Trials (OARDC Agronomy Series 212, J. E. Beuerlein and A. F. Schmitthenner, 1985-86), Sherman has performed about the same as Zane, Harper and Sprite (Table 5). Sherman has yielded 2 to 9 percent lower than comparable commercial strains, however, no public variety is evaluated with seed treatment to control phytophthora, whereas some of the commercial entries may be treated.

Sherman yielded 82 bu/a in narrow rows at the Northwestern Branch in 1986, but did not respond as well in narrow rows in 1985 or at the Western or Southern Branches (Table 6, from Ohio USDA-ARS Trials, R. L. Cooper). Overall it was comparable to other varieties, but may be even more responsive to favorable rainfall than the semidwarf varieties Hobbit and Sprite. Sherman was released largely on the basis of its regional data, and 1986 performance trials from Iowa and Illinois (Table 7, from University of Illinois, College of Agriculture, Cooperative Extension Circular, 1268, Performance of Commercial Soybeans in Illinois and Iowa State University, Cooperative Extension Service, AG18-6, 1986 Iowa Soybean Yield Test Report) which show that it is one of the best performing public varieties in those states.

Table 4. Comparative yield (bu/a) for Sherman and other soybean varieties and strains (ranked by maturity) from the Advanced Line Tests B and C, 1985 and 1986.

Variety or Strain	1985 B 5 tests	1985 C 4 tests	1986 B 6 tests	1986 C 6 tests	1985-86 B 11 tests	1985-86 C 12 tests
Zane	46	43	47	46	47	45
Pella	43	—	45	—	44	—
AP330	48	—	45	—	46	—
Hobbit	45	44	45	—	46	—
TS350	48	46	42	—	45	—
Sprite	—	43	39	—	—	—
Harper	—	—	47	—	—	—
SHERMAN	46	39	46	48	46	44
A3127	48	46	47	48	48	47
Williams 82	45	42	—	46	46	44
Sparks	—	45	48	49	—	47

Table 5. Comparative yield (bu/a) for Sherman and other soybean varieties and strains (ranked by maturity) by location[1] from the Ohio Soybean Trials, 1983 to 1986.

Variety or Strain	Western Branch, S. Charleston		West Central, Auglaize Co.		Northwestern Branch, Custar		ODNR, Vickery	Overall Means			
	1985	1986	1985	1986	1985	1986	1986	1985 3 tests	1986 3 tests	1985-86 6 tests	1985-86 7 tests
Zane	55	61	51	65	53	64	39	53	63	58	55
V295	61	55	59	64	55	64	36	58	61	60	56
Pella	61	55	50	63	57	66	35	56	61	59	56
GB20	61	51	50	69	57	64	—	56	61	59	—
SG315	61	57	53	61	57	67	32	57	62	59	55
F3320	66	52	58	63	62	66	34	62	60	61	57
V311	61	58	48	65	57	64	38	57	62	59	56
GL3200	66	60	54	59	59	63	—	60	61	60	—
Warren	65	58	54	56	56	55	—	58	56	57	—
A2943	65	60	52	73	52	69	—	57	67	62	—
SG324	63	57	55	63	62	72	38	60	64	62	58
Sprite	60	53	59	64	56	61	38	57	60	58	55
Harper	59	56	61	69	56	65	29	55	63	59	54
SHERMAN	59	55	48	65	53	68	36	52	63	57	55

[1]Western Branch and Northwestern Branch are OARDC branch stations. West Central is an on-farm test site. ODNR is Ohio Department of Natural Resources station, formerly North Central Branch, OARDC.

Table 6. Comparative yield (bu/a) for Sherman and other soybean varieties (ranked by maturity) by location[1] from the USDA-ARS Row Width Trials, 1985-86.

Variety	Northwestern Branch, Custar					Western Branch, S. Charleston					Southern Branch, Ripley			Northwestern & Western Branch			
	1985-86		1986		Lodging	1985-86		1986		Lodging	1986		Lodging	1985-86		1986	
	30"	7"	30"	7"		30"	7"	30"	7"		30"	7"		30"	7"	30"	7"
Zane	52	62	64	77	1.3	60	72	58	70	2.3	—	—	—	56	67	61	73
Pella	55	69	62	79	1.5	62	70	58	64	2.5	—	—	—	58	69	60	72
Hobbit	59	66	65	75	1.0	65	76	63	72	2.0	—	—	—	62	71	64	73
Sprite	51	62	57	72	1.0	57	73	63	69	2.5	—	—	—	54	68	60	71
Harper	—	—	49	68	1.0	—	—	—	—	—	44	49	2.0	—	—	—	—
SHERMAN	58	68	62	82	2.3	63	67	62	62	3.8	45	50	1.8	60	67	62	72
Chamberlain	—	—	62	70	4.5	—	—	60	62	3.5	42	59	2.3	—	—	61	67
Williams 82	56	62	62	71	1.3	62	70	62	67	2.0	43	53	1.7	59	69	62	69

[1]Northwestern Branch, Western Branch, and Southern Branch are OARDC branch stations.

Table 7. Comparative yield (bu/a) for Sherman and other soybean varieties (ranked by maturity) from the Illinois and Iowa Soybean Performance Trials, 1986.

	Iowa	Illinois					
	Central	Central			Northern	Southern	Combined
	30''	30''	7''	7''	30''	30''	30''+7''
Variety	2 tests	4 tests	1 test	2 tests	1 test	1 test	8 tests
Zane	51	—	—	—	—	—	—
Pella 86	51	56	58	56	55	71	59
Hobbit	—	58	59	47	60	58	58
Harper	50	58	51	53	57	71	59
SHERMAN	54	59	62	57	55	63	60
A3127	50	—	—	—	—	—	—
Chamberlain	—	58	52	54	61	67	59
Williams 82	44	53	47	48	46	69	55

Characteristics

Sherman has white flowers, gray pubescence, brown pods at maturity, and shiny yellow seed with buff hila. It is a Maturity Group III soybean variety (Table 8) and it is best adapted to approximately 40° to 42° N Lat. It is the same as Harper in maturity, about the same height, and slightly more lodging-prone than Harper. It is a very short, indeterminate variety normally 6 to 7 inches shorter than Chamberlain or Williams 82. Only the semidwarf varieties such as Hobbit are appreciably shorter. However, Sherman's short stature does not make it more lodging resistant than other indeterminate varieties such as Zane, Pella or Harper. Sherman has relatively small seeds, which on average, have good seed quality, acceptable small protein content and moderately high oil content (Table 9).

Disease Resistance

Sherman was evaluated in Ohio and Regional Tests for field resistance or tolerance to phytophthora rot caused by *Phytophthora megasperma* f. sp. *glycinea* (Drech.) Kuan & Erwin (Table 9). Sherman is susceptible to phytophthora rot, it appears to be similar to Harper in tolerance to the disease. Its good performance in 1984 at the Northwestern Branch may represent escape from severe disease, not tolerance, although Sherman usually performs best at that branch. Regional test data for other diseases (Table 10) show that Sherman is resistant to bacterial blight [caused by *Pseudomonas glycinea* (Coeper) and bacterial pustule [caused by *Xanthomonas phaseoli* (E. F. Smith) Dawson var. *sojensis* (Hodges) Stair and Burkholder]. Sherman is moderately resistant to race 2 of frogeye leaf spot

Table 8. Comparative growth data for Sherman and other soybean varieties (ranked by maturity) from the Ohio Advanced Line Tests, 1980-86, and the Uniform Soybean Tests, Northern States, 1982-84.

	Relative Maturity[1]		Lodging Score[2]		Height (in)	
Variety	Regional Tests	Ohio Test	Regional Tests	Ohio Tests	Regional Tests	Ohio Tests
Zane	3.0	3.0	1.5	1.7	33	34
Pella	3.1	3.1	1.5	1.6	35	35
Hobbit	3.4	3.4	1.3	1.3	22	23
Harper	3.4	3.4	1.4	1.4	33	30
SHERMAN	3.4	3.4	1.8	1.8	31	31
A3127	—	3.5	—	1.6	—	33
Chamberlain	3.6	3.7	2.1	1.7	37	37
Williams 82	3.9	3.9	1.7	1.9	38	38

[1]Relative maturity scores are composed of whole digit maturity group followed by a decimal which relates to placement in maturity group. Higher scores indicate later maturity.
[2]Lodging scores are based on a 1.0 (100% erect) to 5.0 (100% prostrate) scale.

[caused by *Cercospora sojina* (Hara)], bacterial tan spot (caused by *Corynebacterium flaccumfaciens* (Hedges) Dawson], and soybean mosaic virus (SMV) seed mottling. It is susceptible to purple seed stain [caused by *Cercospora kikuchii* (T. Masu. & Tomoyasan)], pod and stem blight [caused by *Diaporthe phaseolorum* (Cke. & Ell.) Sacc. var. *sojae* (Lehman) Wehm.], brown stem rot [caused by *Phialophora gregata* (Allington and Chamberlain) W. Gams], and powdery mildew (caused by *Microsphaera diffusa* Cke. & Pk.). Compared to Harper, Sherman is slightly less tolerant to Fe chlorosis, equal in resistance to shattering and equal in ability to emerge from deep late plantings.

Availability

Breeder seed of Sherman was distributed to foundation seed organizations in Illinois, Indiana, Kansas, Kentucky, Missouri and Ohio for planting in 1985. Certified seed was first available to commercial growers since the spring of 1987. Breeder seed is being maintained by The Ohio State University, Ohio Agricultural Research and Development Center, Wooster, Ohio 44691. Sherman has variety registration number 195 with the Crop Science Society of America and has been granted a Plant Variety Protection Certificate, number 870007 with Title V protection, restricting production as a named variety to classes of certified seed.

Table 9. Comparable Phytophthora rot and seed quality data for Sherman and other soybean varieties (ranked by maturity) from the Advanced Line Tests, 1983-86, and Uniform Soybean Tests, Northern States (USTNS), 1982-84.

	Phytophthora Rot[1]					Seed Quality[2]			
	Northwestern Branch		Tolerance		Resistance			Composition	
	1984		(score)			Quality	Size	Protein	Oil
Variety	Yield (bu/a)	Stand (score)	ALT 1983-86	USTNS 1982,84		(score) (58)	(gm/100) (83)	% (20)	% (20)
Zane	27	3.9	3.3	2.9	S	2.3	18.5	40	22
Pella	12	4.1	2.8	2.9	S	2.1	17.9	39	21
Hobbit	17	4.3	3.5	3.4	S	1.8	14.9	38	22
Harper	19	4.5	3.4	3.4	S	1.9	18.4	41	21
SHERMAN	43	2.0	3.6	3.4	S	1.9	15.0	40	22
A3127	—	—	3.0	—	S	—	—	—	—
Chamberlain	18	4.4	—	—	S	1.9	17.1	40	21
Williams 82	52	1.4	2.2	1.8	R	1.7	16.0	41	21

[1]Phytophthora rot was severe at Northwestern Branch in 1984, affecting stands and yield. Stand and tolerance scores are based on a 1.0 (100% survival and vigor) to 5.0 (100% mortality) scale, a 3.0 score is a useable level of tolerance and resistant lines usually score 2.8 or lower. Chamberlain estimates based on 1984 data only.

[2]Seed quality scores are based on a 1.0 (perfect yellow seed coat, freedom from disease and insect damage) to 5.0 (100% mottled or damaged seed) scale. Numbers in parenthesis indicate number of tests.

Table 10. Comparable stress and disease data for Sherman and other soybean varieties (ranked by maturity) from the Uniform Soybean Tests, Northern States, 1982-84[1].

Variety	Fe Chl.	Emerge	Shatter	FL 2	BB	BP	BTS	SMV	PM	PS	PSB	BSR	
												Plants	Stems
	score									%			
Tests	4	3	7	2	1	1	2	3	1	3	3	2	2
Zane	2.5	5	2.0	1.5	1	2.3	3	3	4	23	27	100	56
Pella	3.4	2	1.4	1.5	1	2.5	4	5	1	32	27	100	81
Hobbit	2.6	1	1.2	2.5	1	1.0	2	3	1	18	24	100	59
Harper	2.9	5	1.4	3.0	1	1.0	3	5	1	12	15	100	78
SHERMAN	3.1	5	1.9	1.5	1	1.0	2	2	5	30	20	100	72
Williams 82	3.0	4	1.2	3.0	1	1.0	3	4	1	24	19	100	77

[1]Scores based on 1.0 (no affected plants) to 5.0 (all plants affected) scale. Fe. Chl.=Iron chlorosis; FL=frogeye leaf spot, race 2; BB=bacterial blight; BP=bacterial pustule; BTS=bacterial tan spot; SMV=soybean mosaic virus mottling; PM=powdery mildew; PS=purple seed stem; PSB=pod and stem blight; and BSR=brown stem rot.